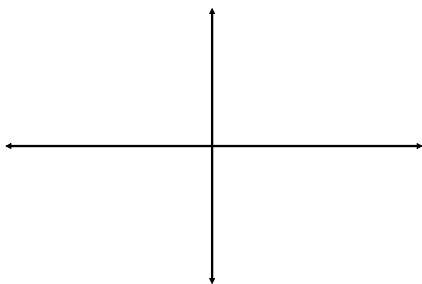


Objective: Students will be able to understand the origins of the **UNIT CIRCLE** and how each trig function gets its values when given an angle in the unit circle.

**On your engineering paper, draw a coordinate plane that takes up approximately half the page.**



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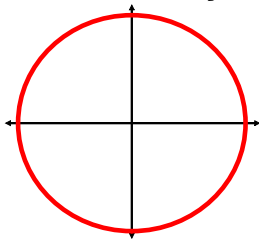
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Objective: Students will be able to understand the origins of the **UNIT CIRCLE** and how each trig function gets its values when given an angle in the unit circle.

**Use a compass to draw a large circle with the center at the origin of the coordinate plane.**

**Neatly!**



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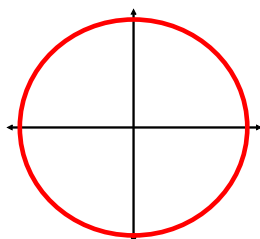
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Objective: Students will be able to understand the origins of the **UNIT CIRCLE** and how each trig function gets its values when given an angle in the unit circle.

**This is a **UNIT** circle.  
What do you think that means?**

**Label all four "corners" with their corresponding ordered pairs.**



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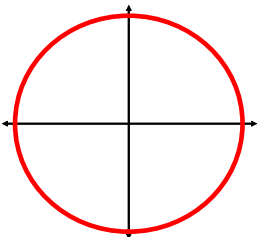
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Objective: Students will be able to understand the origins of the **UNIT CIRCLE** and how each trig function gets its values when given an angle in the unit circle.

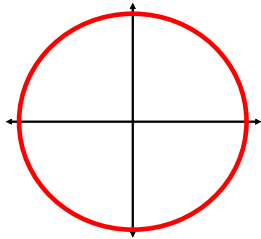
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**By the time we are finished, this circle will have 16 ordered pairs labeled on it!**

In order to do so, we need to review some stuff about special right triangles!



In order to do so, we need to review some stuff about special right triangles!



These are 45-45-90 right triangles.

Click the triangles!

Do you remember the relationship between the sides and the hypotenuse?

The image displays four 45-45-90 right triangles arranged around a central text prompt. Each triangle has a right angle at the bottom-left vertex, indicated by a small square. The top-left angle is labeled 45° in blue, and the bottom-right angle is also labeled 45° in blue. The triangles are distinguished by their side labels: the top-left triangle has a red '3' next to its vertical leg; the top-right triangle has a red '5' next to its horizontal leg; the bottom-left triangle has a red '1' next to its vertical leg; and the bottom-right triangle has a red 'x' next to its horizontal leg.

triangles

Do you remember the relationship between the sides and the hypotenuse?

3

45°

45°

5

45°

45°

1

45°

45°

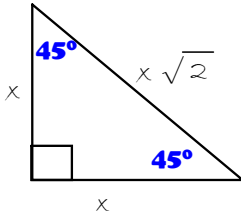
x

Do you remember the relationship between the sides and the hypotenuse?

Objective: Students will be able to understand the origins of the **UNIT CIRCLE** and how each trig function gets its values when given an angle in the unit circle.

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**This is important for later!  
Circle it in your notes!**



A right triangle is shown with a vertical leg labeled  $x$ , a horizontal leg labeled  $x$ , and a hypotenuse labeled  $x\sqrt{2}$ . The two base angles are both labeled  $45^\circ$  in blue. A right angle symbol is at the vertex where the two legs meet.

A right-angled triangle with a square symbol at the bottom-left vertex. The two legs are labeled  $x$ . The hypotenuse is labeled  $x\sqrt{2}$ . The two acute angles are labeled  $45^\circ$ .

These are **30-60-90** right triangles. Use the patterns to find a relationship like you did in the last problem.

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5      10      30°

60°

$5\sqrt{3}$

17      34      30°

60°

$17\sqrt{3}$

x      2x      30°

60°

$x\sqrt{3}$

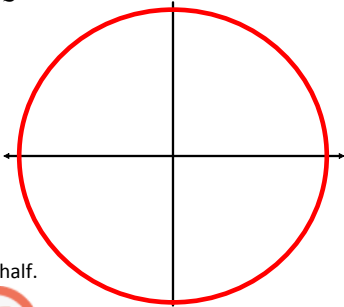
**This is important  
for later!**  
**Circle it in your  
notes!**

Let's go back to our **UNIT CIRCLE...**


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**How many degrees are in a full circle?**

Label the degrees and the quadrants.



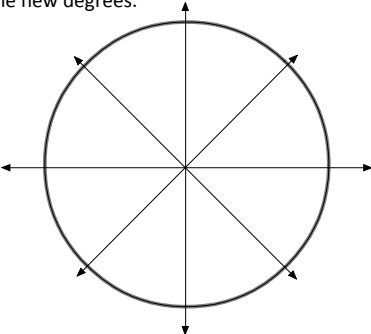
Cut the quadrants in half.



Let's go back to our **UNIT CIRCLE...**

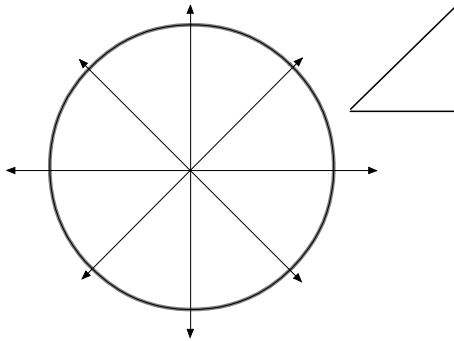
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Label all of the new degrees.

A unit circle is centered on a coordinate plane. The x-axis and y-axis are shown, with arrows at their ends. Two diagonal lines also pass through the center, dividing the circle into eight equal sectors. Each of the four diagonal lines has an arrow at its end pointing outwards from the center. The sectors are currently unlabeled.[illegible][illegible][illegible]

Let's go back to our **UNIT CIRCLE...**

How do we find the coordinates of these new points?



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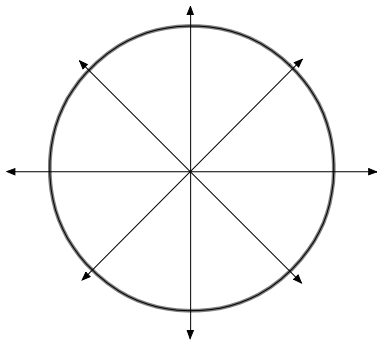
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Let's go back to our **UNIT CIRCLE...**

Label all the new ordered pairs...



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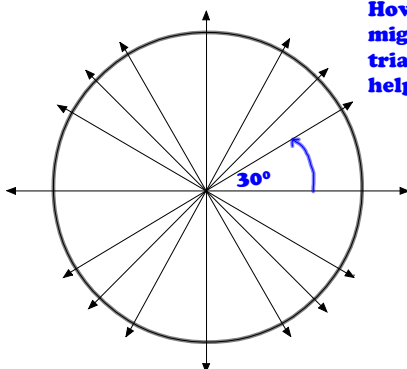
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Let's go back to our **UNIT CIRCLE...**

**How  
might our  
triangles  
help us?**



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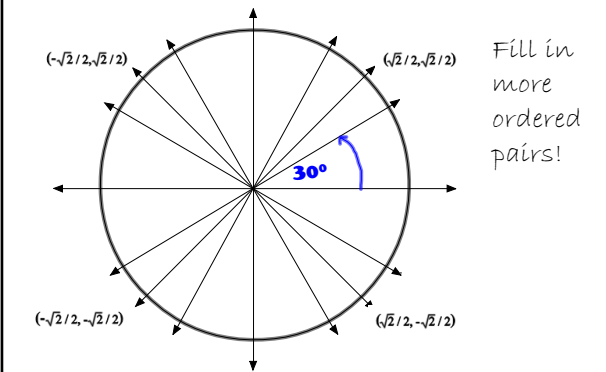
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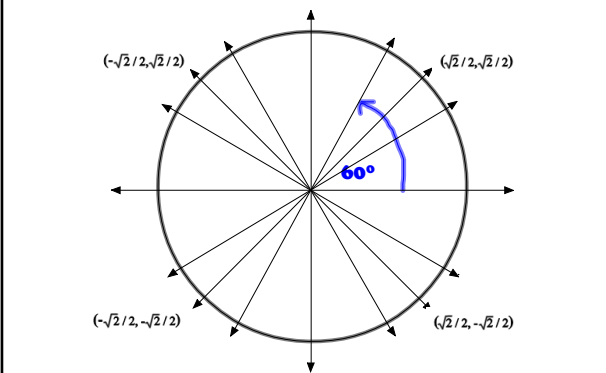
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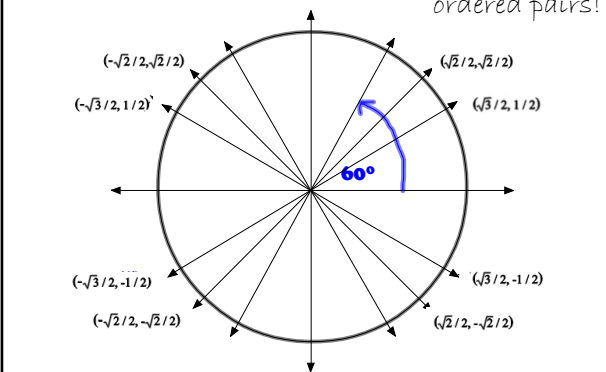
Let's go back to our **UNIT CIRCLE...**

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins or other markings on the paper.

Let's go back to our **UNIT CIRCLE...**

[illegible]

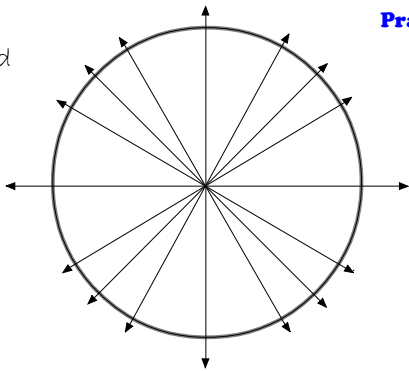
Let's go back to our **UNIT CIRCLE...** Fill in more

[illegible]

Let's go back to our **UNIT CIRCLE...**

Fill in  
more  
ordered  
pairs!

**Practice!**



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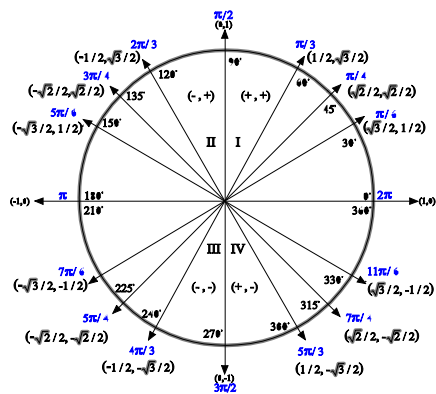
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